

The Ballarat Naturalist

October 2014

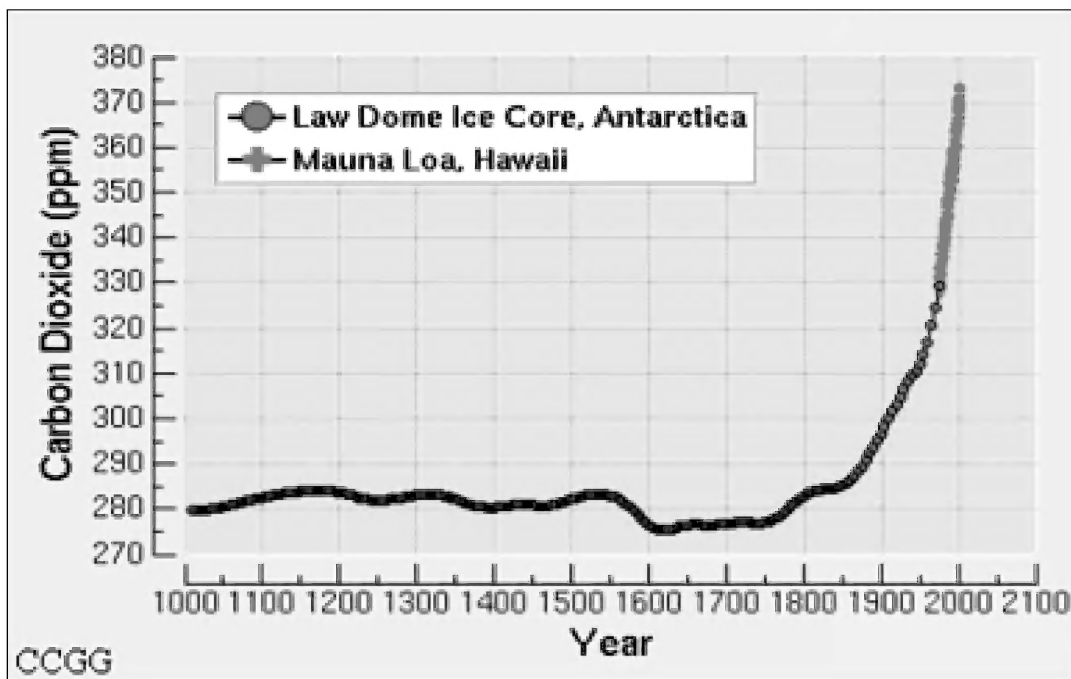


Carbon Dioxide: Plant Food or Pollutant?

Talk by Dr Sabine Tausz-Posch and Professor Michael Tausz,

We were honoured to have as guest speakers at September's meeting Dr Sabine Tausz-Posch and Professor Michael Tausz, from University of Melbourne's Creswick Campus. Both are involved in research on effects of raised CO₂ levels on crops, at the Australian Grains Free Air Carbon dioxide Enrichment (AGFACE) project in Horsham, in collaboration with DEPI.

Last year carbon dioxide (CO₂) concentration passed 400 ppm, the highest level for at least three million years. This 'elevation' is bringing major changes to climate and other dangers to society. Their lecture covered a less well-known aspect of CO₂ research: effects of elevated CO₂ on plant performance and growth.



Graph: The exponential rise in global atmospheric CO₂ concentration

Atmospheric CO₂ concentration is predicted to rise by ~40% in the next 40 years, i.e. to ~550 ppm by about 2050. CO₂ is not considered a pollutant under the usual definition because it is not directly harmful to health or comfort of humans. However, 'elevated CO₂'

has major effects as a greenhouse gas, by contributing to an increase in global temperature.

Rising CO₂ concentrations will also have profound effects on the physiology and growth of crops, because plants take up CO₂ and (through photosynthesis) manufacture carbohydrates and release oxygen. While plant growth under elevated CO₂ has been well studied in greenhouses, the AGFACE project at Horsham studies the effects on crops in paddocks. AGFACE is one of seven projects employing internationally FACE technology. The experiments involve placing rings of pipes around a plot, so that CO₂ can be released through perforations in pipes, from the upwind side. Wind sensors enable the release of CO₂ to change as the wind direction changes. A central sensor measures the level of CO₂ and ensures that this is kept at 550 ppm in daylight hours. The performance of these 'treatment' crops is compared with that in control plots kept at current atmospheric CO₂ levels.

The research on wheat crops showed that CO₂ at 550 ppm results in an increase of around 18% in both total biomass and grain yield. However, under raised CO₂ grain protein fell by 13% and some macro and micro nutrients fell by 10-20%. These broad results are similar to those obtained internationally, but hide many differences in performance between varieties, as well as seasonal effects (e.g. dry versus wet years).

A main mechanism for increased growth under elevated CO₂ is that stomata do not open as widely to absorb CO₂, and consequently available water is used more efficiently. Higher CO₂ levels allow faster growth, as long as other plant requirements are suitable - such as light, water, minerals (and temperature).

The depression in protein and nutrients under elevated CO₂ has serious implications for nutrition and food industries globally. Hence, international FACE research seeks to understand the responses to elevated CO₂, and the plant traits that are associated with different responses seen between varieties.

Responses to elevated CO₂ by different wheat varieties

Australia's wheat varieties have been bred for high grain yield and protein, and to cope with drought, frost, disease, salinity etc., under rain-fed farming systems. Breeding has involved selection for genetic traits such as transpiration efficiency, restricted tillering (sprouting at stem's base), stem carbohydrate storage or early vigour.



Photo: Part of the AGFACE Project at the DEPI research station, Horsham

investigated by comparing performance of different cultivars or lines, growing side by side.

Some examples of results are summarized below:

- Results indicate that wheat cultivars bred for ‘superior transpiration efficiency’ may still gain advantage under elevated CO₂. This is contrary to previous assumptions that transpiration efficiency would be less beneficial under raised CO₂ levels.
- Previous research suggested that the best possible gain from elevated CO₂ is in cultivars bred for ‘high tillering’ capacity. Results from AGFACE however, show that the right combination between tillering capacity and ‘plasticity’ in reproductive traits will be most advantageous under raised CO₂. Some older wheat varieties perform better than modern varieties under raised CO₂ levels.
- An important factor likely to affect future crop performance is ambient temperature, which will rise markedly along with CO₂ levels. This aspect is investigated by examining plant responses in periods of extreme heat during the crop season. Numerous other interactions are covered in design of experiments.

John Petheram

Excursion to Lilwarre

The September 6th Field Nats excursion was a most enjoyable day shared by the biggest group we have had for a long time. Twenty six people were welcomed by Emily and Peter Noble to their bush block at Monkey Gully, beyond Smythesdale. The weather was just perfect. Perhaps it was exactly what was needed after a long, grey, shut-in winter – a chance to wander and enjoy seeing the bush awakening and preparing to spring into action again.

Peter and I were delighted to be joined by one of our daughters, Allison O'Neill, her husband Graham and their two beautiful girls, Emma 9 and Kate 7 (grandmother rights here). I was pleased to see how much the girls enjoyed finding, looking, touching, smelling, admiring, questioning and collecting treasures.



Photo: Field Nats near Lilwarre wetlands

During the day, of special interest to them was a dead barn owl shown to us by John Gregurke and found days earlier by Genny Binns. We were all fascinated by this chance to closely observe the marvellous ragged wing edges to enable silent flight. Both girls held the owl and noticed its beautiful markings, softness, feet with claws to enable catching and its deep set eyes.

Emily and Peter have evidently explored this block in detail and they will make wonderful custodians. They are building a home there,



Photo: Twany Frogmouth pair

partly of materials already on site, especially rocks. They had prepared a map trail which we loosely followed. Before we had gone far we stopped to admire a pair of tawny frogmouths. An early binoculars lesson here for Emma

and Kate who were impressed by the sighting as we all were. The birds were more in the open than they often are and clear against the blue sky. Several chough nests were observed during the day and a male scarlet robin added a bright splash of colour. The girls commented on the how many different bird calls they noticed but mostly we were looking at orchids. Emily has recorded at least thirty-one species and knows the precise location of them all and will protect each one.

During the day we saw hundreds of leaves of orchids and if they flower as promised, the display in a few weeks will be beautiful. We saw a single flowering Maroonhood *Pterostylis pedunculata* but close by there are many about to flower. Nodding Greenhoods *Pterostylis nutans* occurred in several places, some in full flower, some spent. Tall Greenhoods *Pterostylis melagramma* were flowering, as were Emerald Greenhoods *Pterostylis smaragdina*, Bearded Midge orchids *Corunastylis morrisii* and Bronze Bird orchids *Chiloglottis x pescottiana*. In bud were Common Bird orchids *Chiloglottis valida* and leaves of several other species were widespread and sometimes so thick on the ground it was hard to avoid stepping on them. We walked a little way to see the Mayfly orchid *Acianthus caudatus* in flower and needed sharp eyes to see them. While we concentrated on orchids, many of the plants we usually see in our area were there. Some were just flowering, others yet to do so but all promise a colourful spring display.



Photo: Emerald-lip Greenhood, *Pterostylis smaragdina*



Photo : Spider in Trap door nest

We were shown a concealed mud wasp nest, a trapdoor spider's hinged burrow lid which was almost indiscernible, particular trees favoured as homes for several birds, three sundew species, a large wetland which is clearly a wonderful habitat for many creatures, mullock heaps and just over Emily and Peter's fence are

numerous Enfield grevillea plants, *Grevillea bedggoodiana*.

Emily and Peter provided us with a list of 192 plants and 72 birds and I'm sure they hope to add to both as they settle into their completed home. This is a block we hope to revisit as time and seasons pass. A most enjoyable excursion.

Claire Dalman

Excursion to Clunes Forest 16 September

This mid-month excursion was organised after receiving information from John Higgins, Maryborough FNC secretary, about the identity of a eucalypt that puzzled us during the July excursion.

John was able to meet us and lead us to some interesting trees in Dunach Nature Conservation Reserve. The first tree we visited was *Eucalyptus nortonii* which has several common names including Mealy, Silver or Large-flowered Bundy. This plant is closely related to Long-leaved Box *E. goniocalyx*. *E. nortonii* and has buds, gum nuts and mature leaves with a waxy covering given these parts a blue-green appearance. More information about the close relationship and overlapping characteristics of these species can be found at <http://geoffpark.wordpress.com/2011/05/15/nortonii-or-goniocalyx-help-please/> which includes observations made by the late Ron Hateley.

Further into the forest we were taken to a tree, known locally as Dunach Peppermint, which appears closely related to Broad-leaved Peppermint *E. dives*. The tree was coppice regrowth with 6 stems.

Nearby was the Goldfields Stringybark *E. aurifodina* first found and

later described by Kevin Rule. This plant is closely related to Broad-leaved Stringybark *E. dives* which has larger gum nuts. Rule's description of *E. aurifodina* was published in *Muelleria* in 2012 and can be accessed at [http://www.rbg.vic.gov.au/documents/](http://www.rbg.vic.gov.au/documents/Muelleria_30%282%29_Rule_Low_Res.pdf)

[Muelleria_30%282%29_Rule_Low_Res.pdf](#) Other Goldfields Stringybarks were found along Fells Gully Road and on the hillside near the eucalyptus distillery. At Fells Gully Road, Goldfields Stringybarks and Red Stingybark *E. macroryncha*, identified by their domed gum nuts, were growing in the same area.

A dense green bush along Fells Gully Road was not recognised by those present. We did find some seed pods which indicated it was a pea. Research showed it was Scented Bush-pea *Pultenea graveolens*. This plant is listed as threatened under the Victorian Flora and Fauna Guarantee legislation. Nearby Gorse Bitter-pea *Daviesia ulicifolia* was flowering.



Photo: Leopard Orchid *Diuris pardina*

A variety of orchids were seen during the day. The most colourful being Waxlip *Glossodia major*, Pink Fingers *Caladenia carnea* and Leopard Orchid *Diuris pardina*. One pure white Waxlip was observed. Wattles in flower were Golden Wattle *Acacia pycnantha*, Hedge Wattle *A. paradoxa*, Gold-dust Wattle *A. acinacea* and Thin-leaf Wattle *A. aculeatissima*. Low shrubs, White Marianth *Rhytidosporum procumbens* with white flowers and Spiky Guinea-flower with yellow flowers, were scattered in the dry bush.

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5 Oct. Exc.-Field trip to The Grampians .

Visit to both the Pomonal and Halls Gap Wildflower Shows
A hired **mini-bus** will leave from the usual carpark at 9.30am
(daylight saving time!) . Cost \$15 **plus** \$5 & \$4 entry charges

Media Release: Friends of Canadian Corridor, 21Sept ‘14

People from across Ballarat and district met in the Canadian Forest in Mount Clear on Saturday morning to participate in the Friends of Canadian Corridor launch of the proposal for a Canadian Multi Use Forest Park on 619 hectares of forest and ex plantation land. “We want a Canadian Forest Park”, was the unanimous call of one hundred and twenty-five attendees.

Special guests included the Mr Geoff Howard MP, and state election candidates Mr Tony Goodfellow and Ms. Sonia Smith. Mr Bob Hartmann, Co Convenor of the Friends said, “It is time for the Canadian Forest to be cared for. We call upon all political candidates in the forthcoming state election to provide statements of commitment from their leaders and to include the Canadian Multi Use Forest Park in their party’s platform.”

Last Friday Daniel Andrews, Victorian ALP leader, and local member Mr. Geoff Howard, publicly announced their enthusiasm for the Forest Park project with a \$2 million promise for establishing the “Canadian State Park” upon election. The Greens candidate Mr Tony Goodfellow and Nationals candidate Ms Sonia Smith also congratulated the Friends on their initiative in seeking to protect a Ballarat gem - a valuable green forest corridor to enhance habitat for birds and koalas and also provide opportunities for recreation and tourism.

The large crowd were treated to a Welcome to Country and smoking ceremony by Uncle Bryon Powell, Wadawurrung. It was a beautiful ceremony that strengthened a sense of community for all. Uncle Bryon emphasized the forest’s meaning and the need to look after it for generations to come. To commemorate the launch young people planted four indigenous trees as a symbol of returning the denuded ex-plantation land to the forest.

Many people stayed on for a wildflower walk with local field naturalists, followed by refreshments at Earth Ed Centre, Mt Clear. The Friends of the Canadian Corridor formed in November 2012 to represent residents and community groups interested in establishing a

Forest Park. The friends are now made up of approximately 40 community organisations such as walking groups, mountain bikers, field naturalists, environment groups, landcare groups, schools, service clubs, orienteers, running groups, and many individual members. The friends have consulted widely with the City of Ballarat, government departments and community groups interested in the forest so that future generations can enjoy a Canadian Multi- Use Forest Park. The vision includes plans for walking and cycling tracks, picnic area, mountain bike trails as well as protecting koala habitat and Ballarat’s eastern scenic skyline.

FoCC Contact: Jeff Rootes 0408509591, Uncle Bryon & Linda Zibell

Excerpts from Club Meeting Minutes Sept 5, 2014

Meeting: Attendance: 29 members and friends. Apologies: Chris & Anna Baulch, Andy Arnold, Genny Binns, Elizabeth & Denis Thurgood, Dulcie Brooke, Wayne McGuire, John Morrish

Business Arising from Previous Meeting:

The updated Club Membership Form and Constitution are now available on the Club’s website thanks to John Gregurke.

Paul Norquay put in an Expression of Interest for Assessment Panel for nominations for the Exceptional Tree Register

Correspondence IN: Emails from: Environment Victoria: plea to write to Premier Napthine asking him not to scrap the Victorian Energy Efficiency Target; Gayle Osborne, Wombat Forestcare: overview of meeting she had with DEPI Strategic Planning Manager; Simone Blair, DEPI; notification of a Bushfire Management Reform workshop to be held at Creswick in October; The Victorian Serrated Tussock Working Party; Davidson Publicity; Advertisement for “John Gould’s Extinct and Endangered Mammals of Australia” by Fred Ford; Keith Stockwell, secretary of Friends of Terrick Terrick National Park: invitation to attend their “Activities Weekend” in October; Friends Group Newsletter; From Trust for Nature: Guide to their Spring Open Days “Spring into Nature”; Mike Sorrell, FNCB member: link to DEPI’s grants for Local Landscape Enhancement; link to new E-Book from CSIRO on Australian Biodiversity.

OUT: To The Royal Horticultural Society of Victoria: Appointment

of Jennifer Rickerby, Secretary as FNCB proxy for elections. Committee considered and denied request from Environment Victoria for donation.

Reports: Treasurer's Report: Opening balance \$6,096.05

Income \$187 Expenses \$42.77 Closing balance: \$6,240.28

Other reports: Strategic Bushfire Management Planning and Fire Operations Plan meeting between DEPI and environmental groups in the Midlands Fire District. Emily Noble attended. along with representatives from 9 other environmental groups in the Midlands Fire District. Tim Hudspith, Manager of the West Central Risk Landscape, explained how the 7 new Victorian Bushfire Risk Landscapes came about as a result of Recommendation 59 from the Victorian Bushfires Royal Commission. He then gave a brief overview of the process involved in the formulation of the first Strategic Bushfire Management Plan for the Midlands Fire District, a document that he stressed was a great start but would be subject to review, adaptation and development as new data became available. Petina Blackwell, DEPI Chief Scientist, explained measures of ecological sensitivity and stressed that risk evaluation and ecosystem resilience were combined to determine prescriptions for burning. She explained that habitat importance was based on the presence of any of 23 key fauna species and 7 key flora species, chosen based on their life attributes, legislative status and distribution. The overall scope and targets of the Fire Operations Plan were then presented. Checking of Fire Operations Plans against Environmental Values undertaken at the next stage. Measures applied are: presence on Vic. Advisory Lists for Flora and Fauna respectively, listing on the FFG Act or EPBC as protected, known breeding or roost sites, fire sensitive EVC's or EVD's, and local projects (like orchid translocation sites). Representatives from 10 environmental groups attended.

General Business SEANA Autumn 2015 Camp. Any more ideas for field trips/ speakers, etc.? Flyer will be ready to take to SEANA Spring Camp in Portland- John Gregurke.

Val H. putting together a brief list of other accommodation options in Ballarat to be sent to SEANA members in December.

Ideas for keynote speaker on the Friday & Saturday nights: Tony Wilson – birds or plants of Ballarat region; Jenny Sedgewick- Birds of Backyards in the Ballarat area; Martin Scuffins- Birds of Prey in the Ballarat area. Claire Dalman suggested that perhaps Emily Noble could speak on “Orchid Conservation at Home” or orchids of Bal-

larat. Possible site visit to the Bird Park, Buninyong.

Stella Bedggood Memorial Lecture:

Can members please bring along two plates of supper and flowers from their gardens to decorate the room on the night of the Lecture?

Carol H. suggested that, as in previous years, we set up some trading tables and sell Club books and perhaps donated plants or baked goods to raise money for the Club.

Field trip to The Grampians in October. The plan is to visit both the Pomonal and Halls Gap Wildflower Shows so bring some gold coins for entry. Hire of a mini-bus was suggested.

Show and Tell

Carol Hall was lucky enough to see three Pink-eared Ducks at Lake Wendouree.

Jane Marriott recommended a visit to the roadsides between Kooroocheang and Shepherd’s Flat to see a lovely early wildflower display including wattles.

Paul Norquay was awed by a close encounter with a Southern Boobook Owl sitting on a trellis post beside the path that he was walking his dogs along. When it took off, all he heard was a whisper of the first wing-beat, then silence. He also had a close encounter with a Ring-tail Possum in his garden at Mt Egerton when it leapt from one plant to the next just half a metre or so above his head.

Emily Noble had uncommon visits from a Masked Lapwing, White-necked Heron and five Great Cormorants (previously, they had only ever visited on their own) on the wetland of her property this week, and the Maroonhood Orchids and Bronze Bird-orchids have just started to flower. Peter Billing brought along a Tiger Cowrie Shell to show people the beautiful patterning.

John Gregurke saw Pink Fingers (probably *Caladenia carnea*), Blue Caladenia/ Blue Fairies *Cyanicula caerulea*, White Marianth *Rhytidosporum procumbens* and Gorse Bitter Pea *Daviesia ulicifolia* flowering in Clunes Forest on August 31. John also brought along a very well-preserved Barn Owl (*found dead by Genny Binns Ed.*) in the lane behind St Peter's Anglican Church, Sturt St West on 29 August. No broken bones and a small patch of feathers missing from wing suggest it may have collided with a power line. The delicate spotting on the feathers and soft edges to the wing feathers were observed.

CALENDAR 2014

October

- Fri 3 Stella Bedggood Memorial Lecture : *Birds of Prey- "Nursing the Fierce"* - Martin Scuffins, Raptor Expert
- Sun 5 Exc: *Grampians Hinterland & Wildflowers* –Claire Dalman, Club member (See note p 8.)
- 18-26 ANN Get-together, Tasmania
- No committee meeting this month

November

- Fri 7 *History of Botanical Gardens:* Lorraine Powell, Friends of the Ballarat Botanical Gardens
- Sun 9 Exc: *Mt Beckworth:* Bill Murphy and Club members
- Tues 18 Committee meeting at Dalman's

Committee

President Peter Dalman
Vice –President..... Fran Hanrahan
Secretary Emily Noble
Treasurer Les Hanrahan

Claire Dalman	Val Hocking
John Gregurke	John Mildren
Wayne McGuire	

Correspondence: PO Box 328W, Ballarat West, 3350

Email: Secretary:-

Emily Noble

Editor: Fran Hanrahan

Website: <http://fieldnatballarat.wordpress.com>

Club email: ballaratfnc@gmail.com

Meetings are held at the Primary Industries Training Centre, cnr and Gregory Sts, on the first Friday of the month at 7.30pm..

Excursions: Leave from the carpark at the Primary Industries Training Centre, cnr Gillies and Gregory Sts. at 9.30 am, unless otherwise advised.

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